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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHANG, ERIC	
ART UNIT	**PAPER NUMBER**
2116	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/754,483	ODAOHHARA, SHIGEFUMI	
	Examiner	Art Unit	
	Eric Chang	2116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2021 and 13 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-10,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-10,12 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 6-10, 12 and 13 are pending.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 6-10,12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,150,798 to Ferry et al., in view of U.S. Patent 5,498,984 to Schaffer.

4. As to claim 6, Ferry discloses a voltage converter comprising a first and a second power supply circuit [FIG. 3, elements 11 and 12] each capable of converting an input voltage into an output voltage [col. 1, lines 5-7], and means for providing a control signal [FIG. 3, element 13] to activate one of the power supply circuits based on an amount of voltage supplied to said first and second power supply circuits [col. 3, lines 18-39]. Ferry further discloses that the power supply circuits are disposed in parallel [FIG. 3, and col. 4, lines 37-44], wherein only one voltage regulator is active at a time [col. 3, lines 27-35].

Ferry teaches the limitations of the claim, including activating either said first or second power supply circuit based on detecting the amount of voltage supplied to the power supply circuits [col. 6, lines 44-51], and although voltage and current are directly proportional characteristics of electric flow, Ferry does not specifically teach detecting the amount of current supplied.

Schaffer teaches that it is well known in the art to use a current sense amplifier to measure the amount of current supplied to a power supply in various types of electronic equipment [col. 1, lines 9-15]. Thus, Schaffer teaches power supply detection similar to that of Ferry. Schaffer further teaches detecting the flow of current from a battery to a load [col. 8, lines 19-22], and that a current level can be easily converted to a voltage level [col. 8, lines 35-36].

At the time that the invention was made, it would have been obvious to a person of ordinary skill in the art to employ the power supply detection means as taught by Schaffer. One of ordinary skill in the art would have been motivated to do so that the current being supplied to a voltage converter can be converted into a voltage for determining which of the two power supply circuits should be activated.

It would have been obvious to one of ordinary skill in the art to combine the teachings of the cited references because they are both directed to the problem of detecting power being supplied from power source such as a battery in order to properly supply said power to electronic equipment. Moreover, the power supply detection means taught by Schaffer would improve the design of Ferry because it allowed for a more efficiently designed current sense amplifier for the detection of current [col. 1, lines 51-59], such as the current supplied to a power supply circuit.

5. As to claim 7, Ferry discloses the first power supply circuit is a linear, or series, power supply circuit [12], and the second power supply circuit is a switching power supply circuit [11].

6. As to claim 8, Ferry discloses the first power supply circuit is efficient during a low load demand [col. 2, lines 38-46], and the second power supply circuit is efficient during a high load demand [col. 2, lines 34-38].

7. As to claim 9, Ferry discloses the first power supply is activated when the voltage amount available from a battery is lower than a predetermined threshold, and the second power supply is activated when the voltage amount is higher than a predetermined threshold [col. 6, lines 62-65]. Schaffer teaches detecting a current supplied from a battery [col. 8, lines 19-22], and that a detected current level can be easily converted to a voltage level [col. 8, lines 35-36].

8. As to claim 10, Ferry discloses the current amount is low when the voltage converter is in a suspended state, and high when the voltage converter is in a non-suspended state [col. 6, lines 55-61].

9. As to claim 12, Ferry discloses the first and second power supply share a common voltage input [FIG. 3, element 2/Vbat] and common voltage output [FIG. 3, element S/Vout].

10. As to claim 13, Schaffer discloses using a current sense amplifier to detect the amount of current supplied to various types of electronic equipment [col. 1, lines 9-15].

Response to Arguments

11. Applicant's arguments filed April 21, 2005 have been fully considered but they are not persuasive.

12. In the remarks, applicants argued in substance that Ferry uses signals available within the load to control the regulator, and not an amount of current supplied to a first power supply circuit and a second power supply circuit. But Ferry teaches using a signal [TU] indicative of the charge state of the battery with respect to a threshold value [col. 6, lines 44-46]. In addition, Schaffer further teaches detecting the flow of current from a battery to a load [col. 8, lines 19-22], and that a current level can be easily converted to a voltage level [col. 8, lines 35-36]. Thus, the determination of the voltage level used by Ferry is established by using the current sense amplifier as taught by Schaffer on the battery power supply. As a result, Ferry and Schaffer teach detecting an amount of current supplied to the power supply circuits, because it would be obvious to one of ordinary skill in the art that the detected current is converted to a voltage level for use in determining which mode the voltage regulator operates.

13. In the remarks, applicants argued in substance that Ferry does not teach or suggest switching between a first series power supply circuit and a second switching power supply circuit based on the detected current supply. But as Applicant admits in the arguments, Ferry's voltage regulator has three possible operating modes other than the switched-mode power supply operation. Furthermore, Ferry teaches that the three non-switched-mode power supply operations [THRU, SLEEP, LDO] also correspond to the series power-supply operating mode [col. 6, lines 39-65]. In addition, Ferry teaches that the mode control circuit [13] clearly controls

the activation of the first series power supply circuit and the second power supply circuit via control lines [18 & 19], for example, based on a detected current supply signal [TU]. Thus, Ferry teaches that the switching of the voltage converter between a switched-mode power supply and a series-mode power supply.

14. In short, Ferry teaches a voltage regulator that can alternate between a switched-mode power supply and a series-mode power supply. Ferry teaches that the selection can be made based on the current consumed by the load [col. 3, lines 18-26]. However, Ferry also discloses that the selection is further made by determining the voltage supplied to the voltage regulator [col. 3, lines 27-34], and that a number of other factors cause the voltage regulator to change between the switched-mode power supply and the series-mode power supply [col. 6, lines 35-65], including a detected available voltage [col. 6, lines 39-47]. Because Schaffer teaches determining an available voltage based on the supplied current, it would be obvious to use such a teaching to use a detection of the supplied current to activate either said first or second power supply, substantially as claimed.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Chang whose telephone number is (571) 272-3671. The examiner can normally be reached on M-F 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Browne can be reached on (571) 272-3670. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

June 24, 2005
ec

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